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EXAMINER

PEREZ, CARLOS R

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/801,329	Applicant(s) ABDO ET AL.	
	Examiner CARLOS R. PEREZ TORO	Art Unit 2444	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/24/2009; 7/24/2009</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is in response to applicant's amendment filed under CFR 1.111 on 6/3/2009 to non-final office action. Claims 1-46 remain pending.

Response to Arguments

2. Applicant's arguments and amendments filed on 6/3/2009 have been carefully considered but they are not deemed fully persuasive. Applicant's arguments are deemed moot in view of the new grounds of rejection as explained below. The new grounds of rejection were necessitated by Applicant's substantial amendment to the claims which significantly affected the scope thereof. Specifically, by adding new limitations to claims 1, Applicant has changed the scope of dependent claims, which required further search and consideration.

3. Regarding claim 17, Applicant argues that Whiting-Tokunaga fails to expressly disclose "tuning one or more parameters of the compression process ... wherein the tuning comprises increasing a size of a search window used for sequence matching in the compression process when the feedback indicates that the compressed data is being transmitted over the network at a lower than expected rate."

4. Furthermore, it is evident from the detailed mappings found in the below rejection(s) that Whiting-Tokunaga teaches this functionality. Whiting teaches a size of search window used for sequence matching as a compression parameter called MAXSTR. Whiting at col 11/ln 6-7. Furthermore, Tokunaga teaches controlling a compression parameter depending on a quality of communication in order to improve the communication quality. Tokunaga col 3/ln 24-34. Therefore, tuning a size of a search window is nothing more than a straight forward application of Tokunaga's teachings to Whiting's compression parameter of a size of a search window. In addition, it is clear from the numerous teachings (previously and currently cited) that the provision for tuning compression parameters according to a communication quality was widely implemented in the networking art. Thus, Applicant's arguments drawn toward

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distinction of the claimed invention and the prior art teachings on this point are not considered persuasive.

5. For the above stated reasons the rejection is maintained.

Specification

6. In view of Applicant's amendment to the Specification, the objections to the Specification are hereby withdrawn. Examiner concedes that Applicant's amendment does not introduce any new subject matter.

Claim Rejections - 35 USC § 101

7. In view of Applicant's amendments, the § 101 rejections of claims 23-37 is hereby withdrawn.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-16 and 23-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whiting et al. (US 5,146,221) (hereinafter Whiting) in view of Vidal et al. (US 2002/0078241) (hereinafter Vidal).

3. Regarding claim 1, Whiting teaches a method of streaming data over a network from a first device to a second device, the method comprising:

compressing the data at the first device by finding an index in a lookup (hash) table that matches an initial sequence in data (Whiting col 9/ln 42-44; col 10/ln 57-58), wherein:

the lookup table includes a plurality of (bin) entries, each said entry being discoverable utilizing a particular one of a plurality of said (hash value) indices (Whiting col 10/ln 58-60); and

each said entry references whether a corresponding said index is located in a history buffer, and if so, further references (in a hash link table) one or more locations (array pointers) of the corresponding said index in the history buffer (Whiting col 10/ln 58-67); and

if the corresponding said entry of the matching index references a plurality of said locations (Whiting col 9/ln 59):

for each said location, comparing a sequence at the location having the matching index with a sequence in the data, said sequence including the initial sequence (Whiting col 9/ln 49-65);

deriving a matching sequence from the comparison based on at least one of a length and the location of the sequence at each said location (Whiting col 5/ln 61-62);

representing the matching sequence using a representation that includes the length and the location of the matching sequence in the history buffer (Whiting col 5/ln 66-68); and

forming compressed data that includes at least one of said representations (Whiting col 5/ln 61-62).

4. Whiting does not explicitly teach further compressing the compressed data.

5. However in the same field of invention, Vidal teaches using a combination of compression algorithms including:

further compressing the compressed data by encoding the at least one representation, wherein the at least one representation is encoded using a first

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Huffman table for encoding the length using Huffman (Vidal 0041) encoding and using a last recently used (LRU) table for encoding the location of the matching sequence in the history buffer, wherein the LRU table lists a plurality of recently used locations of recent matching sequences (Whiting col 15/ln 11-24), wherein, when the location of the matching sequence is not in the LRU table (cache miss), the location of the matching sequence is encoded with Huffman encoding using a second Huffman table (Vidal 0042) (through the idea of trying a combination of algorithms); and streaming the compressed data over the network to the second device (Vidal 0002).

6. At the time the invention was made, given the teachings for compressing data by matching sequence of data to be compressed with a sequence of data in a history buffer, the teachings of Vidal for using a combination of compression algorithms would have been obvious. One of ordinary skill in the art would be motivated to compress data multiple times with various algorithms in order to achieve a higher compression ratio (Vidal 0042).

7. Regarding claim 2, Whiting-Vidal teaches:

the forming compressed data includes finding one said index in the lookup table for each said sequence in the data (Whiting col 10/ln 58-67).

8. Regarding claim 3, Whiting-Vidal teaches the corresponding said entry of the matching index references a hash chain (hash link table) which includes each said location of the matching index in the history buffer (Whiting col 10/ln 58-67).

9. Regarding claim 4, Whiting-Vidal teaches the initial sequence and the index are each composed of at least two bytes (Whiting col 9/ln 58-61).

10. Regarding claim 5, Whiting-Vidal teaches:

streaming the compressed data over a network, wherein the data is formatted as one or more packets and the packets are compressed for transmission over the network so that the compressing is performed on a per-packet basis (Vidal 0047).

11. Regarding claim 6, Whiting-Vidal teaches:

using the second Huffman table to also compress literal sequences that have no matching index in the history buffer (Vidal 0047); and

streaming the compressed literal sequences to the second device (Vidal 0002).

12. Regarding claim 7, Whiting-Vidal teaches:

if the corresponding said entry of the matching index does not reference any said location, encoding the initial sequence by Huffman encoding using the second Huffman table (Whiting col 2/ln 32);

if the corresponding said entry of the matching index references a single said location:

comparing a sequence at the single said location having the matching index with the sequence in the data (Whiting col 9/ln 49-65);

deriving a matching sequence from the comparison based on at least one of a length and the location of the sequence at the single said location (Whiting col 5/ln 61-62); and

representing the matching sequence using a representation that includes the length and the single said location of the matching sequence in the history buffer (Whiting col 5/ln 66-68); and

when each said sequence of the data is represented or encoded, streaming the data having the encoding or the representation (Whiting col 2/ln 1-11).

13. Regarding claim 8, Whiting-Vidal teaches the comparison to derive the matching sequence is performed utilizing one or more thresholds selected from the group consisting of:

a number of said locations having the matching index to be compared (MAXHCNT) (Whiting col 14/ln 19-21);

a size of a value that describes each said location having the matching index (MEMSIZE) (Whiting col 10/ln 21-24); and

a size of a value that describes a length of the sequence at each said location that matches the sequence in the data that includes the matching index (MAXSTR) (Whiting col 11/ln 6-7).

14. Regarding claim 9, Whiting-Vidal teaches employing a cost function (compare size) to determine if the representation utilizes less memory when stored than the matching sequence, and if so, forming compressed data that includes the representation (Whiting col 5/ln 28-34).

15. Regarding claim 10, Whiting-Vidal teaches determining whether the location of the matching sequence matches one of a plurality of locations in the LRU table (look aside buffer) (Whiting col 15/ln 17-25), wherein:

each said location in the LRU table has a corresponding said LRU representation (Whiting col 15/ln 17-25);

each said location in the LRU table describes one of a plurality of last recently used locations of sequences in previously streamed data (Whiting col 15/ln 17-25); and

if the location of the matching sequence is included in the LRU table, the location of the matching sequence is encoded with a corresponding said LRU representation from the LRU table (Whiting col 15/ln 17-25).

16. Regarding claim 11, Whiting-Vidal teaches one or more computer-readable storage media storing computer-executable instructions that, when executed, perform the method as recited in claim 1 (Whiting Fig 1).

17. Regarding claim 12, Whiting-Vidal teaches a method comprising compressing data for communication in a terminal services environment by:

adding data to a history buffer (history array) (Whiting col 10/ln 56-67);
updating a lookup table that references the history buffer to include the added data, (Whiting col 10/ln 56-67);wherein:

the lookup table includes a plurality of entries, each said entry being discoverable utilizing a particular one of a plurality of indices (Whiting col 10/ln 56-67); and

each said entry references whether a corresponding said index is located in a history buffer, and if so, further references one or more locations of the corresponding said index in the history buffer (Whiting col 10/ln 56-67);

starting a current pointer at the added data in the history buffer (Whiting col 6/ln 62-64);

finding one said index in the lookup table that matches an initial sequence at the current pointer (Whiting col 9/ln 42-44; col 10/ln 57-58);

if the corresponding said entry of the matching index references a plurality of said locations (Whiting col 9/ln 49-65):

comparing a sequence at each said location having the matching index with a sequence in the added input data that includes the initial sequence(Whiting col 9/ln 49-65);

deriving a matching sequence from the comparison (Whiting col 5/ln 61-68);

representing the matching sequence with a representation that includes the location and a length of the matching sequence in the history buffer (Whiting col 5/ln 61-68);

employing a cost function to determine if the representation utilizes less memory space when stored than the matching sequence (Whiting col 5/ln 28-34),

if so, configuring data to include the representation and advancing the current pointer by the length of the matching sequence (Whiting col 5/ln 28-34; col 6/ln 62-64), and encoding at least a portion of the representation to further compress the data by encoding the representation, wherein the representation is encoded using a first Huffman table for encoding the length using Huffman

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encoding and using a last recently used (LRU) table for encoding the location of the matching sequence in the history buffer, wherein the LRU table lists a plurality of recently used locations of recent matching sequences, wherein, when the location of the matching sequence is not in the LRU table, the location of the matching sequence is encoded with Huffman encoding using a second Huffman table (Vidal 0041, 0042),

otherwise, configuring data to include the initial sequence and advancing the current pointer by a length of the initial sequence (Whiting col 5/ln 28-34; col 6/ln 62-64); and

when the current pointer has advanced through the added data, packetizing the configured data for streaming (Whiting col 2/ln 1-11).

18. Claim 13 does not teach or define any new limitations above claim 6, and is thus rejected for reasons similar to those in rejecting claim 6.

19. Claim 14 does not teach or define any new limitations above claims 6 and 7, and is thus rejected for reasons similar to those in rejecting claims 6 and 7.

20. Claims 15-16 do not teach or define any new limitations above claims 10-11, respectively, and are thus rejected for reasons similar to those in rejecting claims 10-11.

21. Claims 23-28 do not teach or define any new limitations above claims 1-6, respectively, and are thus rejected for reasons similar to those in rejecting claims 1-6.

22. Claim 29 does not teach or define any new limitations above claims 6 and 7, and is thus rejected for reasons similar to those in rejecting claims 6 and 7.

23. Claims 30-32 do not teach or define any new limitations above claims 8-10, respectively, and are thus rejected for reasons similar to those in rejecting claims 8-10.

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24. Claim 33 does not teach or define any new limitations above claim 33 and is thus rejected for reasons similar to those in rejecting claims 12. Furthermore, Whiting-Vidal teaches a client including a second processor and a second memory, the client being communicatively coupled to the network for communication with the server and including a second said history buffer, a third Huffman table that includes codes for decoding locations of matching sequences and literal bytes, a fourth Huffman table that includes codes for decoding lengths of matching sequences, the LRU table, and a decompression module that is executable by the client to decompress the streamed data [Vidal 0042];

wherein the client is configured to receive the configured data;

wherein, when an encoded representation is present in the configured data, the decompression module is configured decode the representation using the LRU table, the third and fourth Huffman tables and finds the matching sequence in the second said history buffer based on the decoded location and the decoded length indicated by the representation (Whiting col 16/ln 29-50).

25. Regarding claim 34, Whiting-Vidal teaches the decompression module is further executable by the client to add decompressed data to the second history buffer (Whiting col 16/ln 29-50).

26. Claim 35 does not teach or define any new limitations above claims 6, and is thus rejected for reasons similar to those in rejecting claims 6.

27. Claim 36 does not teach or define any new limitations above claims 6 and 7, and is thus rejected for reasons similar to those in rejecting claims 6 and 7.

28. Claim 37 does not teach or define any new limitations above claim 10, and is thus rejected for reasons similar to those in rejecting claim 10.

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29. Claims 38-39 do not teach or define any new limitations above claim 1, and are thus rejected for reasons similar to those in rejecting claim 1.

30. Claims 40-41 do not teach or define any new limitations above claims 3-4, respectively, and are thus rejected for reasons similar to those in rejecting claims 3-4.

31. Claim 42 does not teach or define any new limitations above claims 6, and is thus rejected for reasons similar to those in rejecting claims 6.

32. Claim 43 does not teach or define any new limitations above claims 6 and 7, and is thus rejected for reasons similar to those in rejecting claims 6 and 7.

33. Claims 44-46 do not teach or define any new limitations above claims 8-10, respectively, and are thus rejected for reasons similar to those in rejecting claims 8-10.

34. Claim 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whiting-Vidal in view of Tokunaga et al. (US 5,968,132) (hereinafter Tokunaga).

35. Regarding claim 17, Whiting-Vidal-Tokunaga teaches most of the limitations as detailed in claim 1. Furthermore, Tokunaga teaches a method comprising:

receiving feedback that indicates availability of resources for communicating the packetized compressed data over the network from the first device to the second device (Tokunaga col 3/ln 24-34); and

tuning one or more parameters (MAXSTR) of the compression process utilized to compress the packetized compressed data in response to the feedback, wherein the tuning comprises increasing a size of a search window used for sequence matching in the compression process when the feedback indicates that the compressed data is being transmitted over the network at a lower than expected rate (Whiting col 11/ln 6-7; Tokunaga col 3/ln 24-34).

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At the time the invention was made, given the teachings of Whiting for compressing data and having a MAXSTR maximum string being searched parameter, the teachings of Tokunaga for controlling a compression parameter according to a quality of communication would have been obvious. One of ordinary skill in the art could obviously apply Tokunaga's teachings to any parameter of a compression algorithm in order to achieve appropriate data transfer (Tokunaga col 3/ln 24-34).

36. Claim 18 does not teach or define any new limitations above claim 1. Therefore, similar reasons for rejection apply.

37. Regarding claim 19, Whiting-Vidal-Tokunaga teaches one or more computer-readable storage media storing computer-executable instructions that, when executed, perform the method as recited in claim 17 (Tokunaga Fig 6).

38. Claims 20-22 do not teach or define any new limitations above claims 17-19 and are thus rejected for reasons similar to those in rejecting claims 17-19.

Comments

39. Examiner, in the body of this action, has pointed out particular references contained in the prior arts of record for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested of the applicant, in preparing the response, to consider fully the entire references as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Conclusion

40. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

41. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CARLOS R. PEREZ TORO whose telephone number is (571) 270-5649. The examiner can normally be reached on Monday-Friday 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Vaughn can be reached on 571-272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/C. R. P./

Examiner, Art Unit 2444

/William C. Vaughn, Jr./

Supervisory Patent Examiner, Art Unit 2444